REMARKS

Reconsideration of the Examiner's rejection of the present application is requested respectfully in view of the above amendments and the following remarks.

STATUS OF THE CLAIMS

Claims 1-21 and 25-29 were pending at the time of the present Office Action. Claims 25, 26 and 29 stand withdrawn from consideration. Claims 15 and 20 have been amended. Claim 21 has been canceled. No new matter has been added by these amendments. Therefore, claims 1-20 and 27-28 are now presented for review.

SUMMARY OF OFFICE ACTION

Claims 15 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite regarding the use of the phrase "according to the classical methods of sugar chemistry". The cited phrase has herein been deleted from claim 15, which should render this rejection moot.

Claim 20 stands rejected under 35 U.S.C. §112, first paragraph, as lacking enablement. This claim has been amended to include the specific compounds set forth in dependent claim 21, which has now been canceled.

Claims 1-19, 27 and 28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of Petitou et al. (US 5378829)in view of Oosta et al. (of record).

Claims 20 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of Petitou et al. (US 5378829) in view of Oosta et al. (of record), further in view of Paoletti et al. (of record).

CLAIM REJECTIONS UNDER 35 U.S.C. §112

Claim 15 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite regarding the use of the phrase "according to the classical methods of sugar chemistry". This phrase has now been deleted at all occurrences in claim 15. It is submitted that this amendment renders this rejection moot.

Claim 20 stands rejected under 35 U.S.C. §112, first paragraph, as lacking enablement. The Examiner indicated that this rejection could be overcome by directing this claim to the specific compounds of claim 21. Accordingly, claim 20 has been amended to include the specific compounds set forth in dependent claim 21, which has now been canceled. It is submitted that this amendment overcomes the present rejection.

CLAIM REJECTIONS UNDER 35 U.S.C. §103(a)

Claims 1-19, 27 and 28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of Petitou et al. (US 5378829)in view of Oosta et al. (of record). Claims 20 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of Petitou et al. (US 5378829) in view of Oosta et al. (of record), further in view of Paoletti et al. (of record). Applicants respectfully traverse these rejections.

As set forth in claim 1, and discussed throughout the specification, the present invention is directed to synthetic polysaccharides containing 8 to 24 monosaccharide units, further characterized as set forth therein. As explained at page 2, lines 4-9, of the specification, prior to the present invention short chain oligosaccharides were known, such as those described in US 5378829, the present Petitou et al. citation, but that that document only describes oligosaccharides having a maximum of 7 monosaccharide units. The Examiner has not cited any other references that teach synthetic polysaccharides of more than 7 units, and Petitou is clearly limited to this size.

The next paragraph on page 2 of the specification, lines 10-20, describes several references which discuss longer fragments of 14 to 20 saccharide units, but these are all made by fractionating longer chain naturally occurring heparin substances. The Oosta et al. secondary reference cited in the present Action is a reference of this type. As indicated on page 2, lines 21-22, a synthesis of polysaccharides of this size presents great difficulties and, in fact, it has never been carried out. As described in the Abstract of Oosta et al., (which was published over 25 years ago) the functional saccharide fragments discussed therein were all made by random scissioning of long-chain porcine heparin. These random length fragments were then examined for their properties. Not only is there no description, or even a suggestion, that these fragments could be synthesized, but there is not even any teaching of how to accurately extract a particular fragment. Since the scissioning was random, the chemistry and properties of the fragments was also random. This may have been useful early research in development of fractionated heparin compositions, but in no way provides any teaching that longer chain fragments, or any fragments for that matter, could be specifically synthesized.

In the present Action the Examiner acknowledges that Petitou et al. only discloses oligosaccharides of seven or fewer saccharide units, and does not disclose compounds having 8-24 units, as in the present invention. Oosta is cited as disclosing the activities of longer chain heparin fragments. However, as discussed above, the longer chain fragments of Oosta et al. are just random moieties cut from long chain porcine heparin. The Action asserts that the combination of these two references somehow teaches the present invention, but applicants submit that this is not the case at all. There is no teaching in Petitou et al. of how to synthesize oligosaccharide chains of more than 7 units. There is no teaching in Oosta et al. of how to synthesize saccharide chains of any length. The technology for such syntheses had not yet been developed. The only teaching of Oosta et al. is that saccharide fragments of more than 7 units, as cut from natural porcine heparin, might have some useful functions. At best this would only suggest that one might want to develop a way to synthesize longer chain fragments, and that is exactly what the present inventors have done. Petitou does not teach how to synthesize longer chain saccharides, and Oosta does not provide any teaching which would add to the disclosure of Petitou et al. The 8-24 unit synthetic polysaccharides of the present invention, and their method of synthesis, are taught for the first time in the present application. For these reasons, the Examiner is respectfully requested to reconsider and withdraw the present rejection of claims 1-19, 27 and 28 under 35 U.S.C. §103(a) over this combination of references.

Claims 20 and 21 (now just claim 20) stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of the abpve two references further in view of Paoletti et al. Paoletti et al. is cited as teaching that aspirin, one of the compounds listed as "another active ingredient" in claim 20 is known to have antithrombotic effects. Applicants do not dispute that aspirin was well known for such effects. However, there is no teaching in Paoletti et al. that aspirin could be combined with a polysaccharide, much less the novel and previously unknown 8-24 unit polysaccharide of the present invention. As discussed above, the combined teachings of Petitou et al. and Oosta et al. do not render obvious the polysaccharides of the present invention. Therefore, the further teachings of Paoletti et al. regarding aspirin cannot render the composition of this novel polysaccharide in combination with aspirin obvious. For these reasons, the Examiner is respectfully requested to reconsider and withdraw the present rejection of claim 20 under 35 U.S.C. §103(a) over this combination of three references.

It is submitted that the claims in the present application are now in condition for allowance, and action to that effect is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment resulting from this Amendment to Deposit Account 18-1982.

Respectfully submitted,

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